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ABSTRACT

Research has shown that unrealistically-optimistic people believe that they will experience fewer negative events and more positive events than other persons. This paper analyzes a scale which was designed to measure the several cognitive dimensions underlying unrealistic optimism about health. For this study, 220 college students completed a 12-item scale which was based on factors of illness invincibility, illness apathy, and lifetime illness likelihood. Participants also filled out items from other scales believed to be related to unrealistic optimism about health. Results indicate that health history was important for the subject only; close relatives with a serious illness did not lessen optimism. People with an internal locus of control were the most optimistic, followed by people who believed "powerful others" were in control. Those who believed that chance played the most important role in determining health outcomes revealed the least optimism. The findings suggest that there is cognition beyond mere illness controllability which may underlie an unrealistic optimism about health. If people believe that they will not become ill, they may be less inclined to take healthy precautions. The scale generated for this study is still in its developmental stage. Some changes are recommended to improve the scale's validity. (RJM)

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BELIEFS UNDERLYING UNREALISTIC OPTIMISM ABOUT SUSCEPTIBILITY TO ILLNESS

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ABSTRACT

Examining unrealistic optimism about susceptibility to illness, Weinstein found that unrealistic optimism was positively correlated with perceived controllability and negatively correlated with experience. Other factors, however, may also be influencing beliefs of illness susceptibility. This paper presents the results of a scale designed to measure the several cognitive dimensions underlying unrealistic optimism about health. A 12-item scale, based on factors of illness invincibility, illness apathy, and lifetime illness likelihood, as well as items from other scales believed to be related to unrealistic optimism about health (The Stanford Time Perspective Inventory, Dispostional Optimism Scale, and the Multidimensional Health Locus of Control) were distributed in an introductory psychology course to 220 undergraduates who participated for extra class credit.

Results of factor analyses indicated that the underlying beliefs are multi-dimensional in nature. Results that supported convergent validity for the 12-item Underlying Health Cognitions Scale (UNC) included a moderate correlation between the UNC and the general optimism scale. Differences in sub-populations (e.g., those who are at risk for disease, past vs future oriented subjects, etc.) and the implications of these differences in health promotion strategies are discussed.

BELIEFS UNDERLYING UNREALISTIC OPTIMISM ABOUT SUSCEPTIBILITY TO ILLNESS

Unrealistic optimism refers to the idea that some individuals believe that negative events are less likely to happen to themselves than to other people and that positive events are more likely to happen to themselves (Scheier & Carver, 1985). Specific to the health domain, an unrealistically optimistic individual tends to view his/her own life as relatively healthy, free of disease and illness, while perceiving that others are not as likely to be as healthy (Weinstein, 1982).

Weinstein has conducted extensive research into unrealistic optimism about health. In his studies, subjects are given a list of specific illnesses and asked to answer how likely it is that (1) they will succumb to the illnesses in their lifetime and (2) others will experience the same. Most subjects showed a significant optimistic bias; that is, they perceived the chance of developing a health problem themselves as lower than their perception of their peers' developing the same problem. Weinstein's findings, that unrealistic optimism about specific diseases and illnesses was positively correlated with perceived controllability and negatively correlated with experience (Weinstein, 1982, 1984), suggest that there are beliefs and behaviors which are associated with a general unrealistically optimistic outlook about future health and illness. The present study describes a scale designed to assess the cognitions which may underlie this unrealistic optimism about health.

One possible explanation for the unrealistic optimism about health phenomenon may lie in the motivation to create a positive illusion about one's own future (Taylor & Brown, 1988). This optimistic orientation may be a means of self-protection (Taylor & Brown, 1988), since an illusion of well-being may hinder focusing on potential negative outcomes. This suggests that an unrealistic optimism about health should be related to a general optimistic bias. An optimistic person may feel invincible to disease. Thus, the more one is optimistic in general, the more likely it is that there will be a corresponding optimism about one's future health. This general optimistic bias may also influence perceptions of illness

probability. If optimism is high, the perceived probability of getting ill should be fairly low. A general optimism scale was included to examine whether the underlying cognitions about health scale developed here covaries with an overall measure of optimism.

Other possible covariates of unrealistic optimism about health that are being considered in this study are time perspective and locus of control. People with a present-oriented time perspective may be more likely to be unrealistically optimistic about their health (Weinstein, 1987). This tendency to concentrate on the present (Reichler & Brickman, 1989) may also inhibit a realistic concern for future illness. Furthermore, given the positive correlation between unrealistic optimism about health and illness controllability (Weinstein, 1982, 1984), it would not be surprising if individuals with a high internal locus of control also exhibit more cognitions which reflect an unrealistic optimism about future health. People with an internal locus of control tend to perceive that their actions determine their illness outcomes. Thus, people with an internal locus of control are expected to be more optimistic about their health. To measure the potential effects of time-orientation and locus of control, measures of each were included in the test packet.

Our Underlying Health Cognitions Scale (UNC) included three factors which may reflect the cognitions underlying an unrealistic optimism about future health and illness. These factors were called Invincibility/Controllability, Lifetime Illness Likelihood, and Illness Apathy. The Invincibility/Controllability factor refers to beliefs that one is not susceptible to death by disease or illness because diseases and illnesses are self-controlled. Lifetime Illness Likelihood items gauge the perceived chances of becoming seriously ill in the course of one's lifetime. Illness Apathy questions ascertain whether or not one is generally concerned about becoming seriously ill.

A number of other scales which measured some constructs related to these underlying beliefs were included. Carver & Scheier's (1985) Dispositional Optimism Scale (DOS) was included to measure general optimism; the Multidimensional Health Locus of Control Scale (MHLC, Wallston, Wallston, & DeVellis, 1978) was included to measure locus of control; Weinstein's 32-item Life Hazards Index (LHI,

Weinstein, 1987) was included to measure unrealistic optimism about specific illnesses and diseases; and the Stanford Time Perspective Inventory (STPI, Zimbardo, 1990) was included to measure time orientation (past, present, future). These measures were included as a multi-trait multi-method analysis of convergent validity. Subjects were also asked if they or any family member had ever had a life-threatening illness in order to determine if those with a history of familial illness were less optimistic than those without any history of family illness.

Method

Subjects

Students (N=220) completed our questionnaire for extra credit in an introductory psychology class. This included 92 females, 118 males and 10 who did not specify their gender.

Materials

Participants completed a large packet of surveys and study premeasures. This premeasure packet included four pages which contained the UNC and the four other scales. Our Underlying Health Cognitions Scale consisted of 12 items designed to measure subjects' cognitions concerning future personal health and well-being. Included with our scale were eight items from the Dispositional Optimism Scale, the Multidimensional Health Locus of Control Scale, Weinstein's Life Hazards Index, and the Stanford Time Perspective Inventory. The Underlying Health Cognitions Scale, Dispositional Optimism Scale, & Multidimensional Health Locus of Control Scale items were all answered on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The Life Hazards Index items were also answered on a 6-point Likert scale, which ranged from 1 (Much below average) to 6 (Much above average). The Stanford Time Perspective Inventory scale was rated on a 5-point Likert scale, ranging from 1 (Very untrue) to 5 (Very true). Subjects also indicated if they or any family member had ever had a life-threatening illness. Space was provided for subjects to indicate which relative and to list the illness.

Results

Prior to any analyses, the necessary items from all scales were reverse-coded so that directionality of items was consistent within each scale. Items were correlated with the UHC scale's total score and with each other to determine weak items (See Table 1). The one item that did not correlate well with other items and did not correlate well with the total score is "I'm very concerned about my health." The reliability of the present scale was fairly high (Cronbach's alpha=0.86).

TABLE 1: Item-Total Correlations

Item Deleted	Correlation with Total
I'm never going to be seriously ill.	0.6598
I can control whether or not I become seriously ill.	0.5333
I will probably die young.+	0.4709
I will probably get a serious illness.+	0.5254
I am not susceptible to disease.	0.5345
My behaviors are the only thing that determines by health status.	0.4293
I don't worry about my health.	0.5073
I don't think I'm at risk for becoming seriously ill.	0.6731
I'm very concerned about my health.+	0.3771
I am worried that someday I'll become seriously ill.+	0.6119
I expect to live a long, healthy life.	0.5356
I'm not concerned about getting a life-threatening disease.	0.5793

(+ indicates items that were reverse-scored)

Other scales included in the packet were used to determine convergent validity of the UHC scale. Correlations of the total scores for the UHC scale, the Dispositional Optimism Scale, the Multidimensional Health Locus of Control Scale, the Stanford Time Perspective Inventory, and Weinstein's scale were obtained. A high score on our scale indicates high unrealistic optimism about health. A low score on Weinstein's Life Hazards Index indicates high unrealistic optimism about health. A high score on the Dispositional Optimism Scale indicates a more optimistic bias. A high score for any factor of the Multidimensional Health Locus of Control Scale indicates a greater locus of control for that factor. A higher score on any factor of the Stanford Time Perspective Inventory indicates a greater emphasis of that type of time perspective.

The UHC scale was negatively correlated with Weinstein's scale ($r = -.29$, $p < .0001$), correlated positively with the Dispositional Optimism Scale ($r = .48$, $p < .0001$), and weakly correlated with both the Multidimensional Health Locus of Control Scale ($r = -.01$, n.s.) and the Stanford Time Perspective Inventory ($r = .11$, n.s.). These scale correlations suggest that the UHC scale is measuring the cognitions which are related to an unrealistic optimism about health, and not some other latent variable.

Factor Analysis

An exploratory factor analysis of the 12-item scale with a varimax rotation yielded a 3-factor solution. Inspection of the scree plot indicated an obvious drop-off after 3 factors. The factors were classified as expected. See Table 2 for the factor loadings.

Table 2: Factor Pattern with Varimax Rotation

	Factor 1 Lifetime Illness Likelihood	Factor 2 Illness Apathy	Factor 3 Invincibility/ Controllability
I'm never going to be seriously ill.	0.44906*	0.27404	0.44160*
I can control whether or not I become seriously ill.	0.18343	0.09049	0.65103*
I will probably die young.+	0.89185*	0.07997	-0.00502
I will probably get a serious illness.+	0.57629*	0.10402	0.27655
I am not susceptible to disease.	0.12116	0.20227	0.57705*
My behaviors are the only thing that determines by health status.	0.04669	0.01337	0.67547*
I don't worry about my health.	0.03429	0.59860*	0.21249
I don't think I'm at risk for becoming seriously ill.	0.23023	0.42821*	0.51912*
I'm very concerned about my health.+	0.02255	0.67940*	-0.06245
I am worried that someday I'll become seriously ill.+	0.31293	0.59423*	0.16423
I expect to live a long, healthy life.	0.72227*	0.11618	0.17082
I'm not concerned about getting a life-threatening disease.	0.12745	0.67377*	0.20570

(+ indicates items that were reverse-scored)
(* indicates factor loadings greater than 0.4.)

Group Differences

After having analyzed the scale, another aim of this study was to investigate why some people are more unrealistically optimistic about their health than others. The results of the factor analysis give some clue, but other factors may be important. For instance, a person's or family's health history, their time perspective, or their health locus of control may be important in whether he/she tends to be unrealistically optimistic about his/her health.

Health history questions were included in the questionnaire packet. The most basic question, "Have you or anyone in your family had a life-threatening illness?" dichotomized subjects for a one-way ANOVA design. As can be seen in Figure 1, subjects who had some family history of illness had a

slightly lower (but non-significant, $p > .10$) mean on the total UHC scale than subjects who did not have any family members with life-threatening illnesses. ANOVA's were performed for specific family members having had a life- threatening illness. Those whose sister or brother, mother or father, aunt or uncle or grandparent had been seriously ill did not have significantly different mean scores on the UHC than subjects whose relatives had not been ill. The only significant difference in means was between the subjects who had themselves been ill and subjects who had not been seriously ill, $F(1,216) = 4.59$, $p < .05$.

Another group difference that was of interest was the locus of control. The Multidimensional Health Locus of Control Scale measured three categories: "internal locus of control", "powerful others", and "chance". A one-way ANOVA indicated that these groups all had significantly different means on the UHC scale, $F=(2,204) = 19.84$, $p < .0001$. The means and standard deviations are listed in Table 3.

The Stanford Time Perspective Inventory was created to determine whether people focus on the past, present, or future. Subjects were reclassified as either being past-focused, future-focused, or present-focused. A one-way ANOVA indicated no significant differences between groups ($p > .10$). Relevant statistics are listed in Table 3.

Table 3: Group Differences

Group	MN	SD	F
Multidimensional Health Locus of Control			
Internal	48.56[a]	11.01	19.84***
Powerful Others	43.83[b]	9.16	
Chance	38.84[c]	9.19	
Stanford Time Perspective Inventory			
Past	39.87[a]	10.36	2.26
Present	43.30[a]	9.33	
Future	43.46[a]	10.87	

NOTE: For each scale: Means with different letters are significantly different from each other at alpha = .05.
*** = $p < .0001$

Additional Analyses

The UHC factors were correlated with the factors of the MHLC and the STPI to determine whether the UHC factors would differentially correlate with the factors of the other scales. As can be seen in Table 4, we found the UHC scale overall significantly covaried with internal locus of control and negatively covaried with chance locus of control. Weinstein's Life Health Index contained a similar trend to the UHC scale (in the reverse direction, since low scores on his scale indicate more optimism), but these were not significant. As one would expect given the results of the ANOVA analyses, no significant correlations arose with the Stanford Time Perspective Inventory.

TABLE 4

UNC Factor and Total Correlations with Other Scale's Factors

	Factor 1 Likelihood	Factor Apathy	Factor 3 Invincibility	UHC Total	Life Hazards Index
MHLC-Internal	.31***	.16*	.54***	.40***	-.11
MHLC-Others	.08	-.12	.14*	.02	-.08
MHLC-Chance	-.42***	-.21**	-.30***	-.37**	.28***
STPI-PRESENT	-.10	-.05	.02	-.06	.07
STPI-PAST	.15*	.01	.06	.09	.07
STPI-FUTURE	.18**	.01	.11	.12	.10
DOS	.46***	.30***	.41***	.48***	-.20**

NOTE: MHLC= Multidimensional Health Locus of Control
STPI= Stanford Time Perspective Inventory
DOS = Dispositional Optimism Scale

* $p<0.05$
** $p<0.01$
*** $p<0.001$

Conclusions

Tests of construct validity (using a multitrait multimethod procedure with other scales) indicated that our scale appears to be measuring the cognitions which may underlie an Unrealistic Optimism about Health. This scale is still in its development stage however, and we suggest some recommended improvements. First, more items should be added to measure the current factors, while some items should be reworded for improved discriminability. At the present, some items are loading on two factors. Future studies may want to consider the use of confirmatory factor analysis to force each item to load on only one factor. Although the present UHC scale had improved reliability over a preliminary version, additional reworking of the items, as well as inclusion of other items attempting to measure these latent cognitions, would help to improve the scale's validity and reliability. Also, other cognitions that underlie unrealistic optimism about health may have been overlooked. Future scales may want to consider other relevant factors, such as self-esteem and self-efficacy, which may also play important motivational roles. Since individual item analyses have not been performed, and until the scale items and relevant factors are further clarified, use of this scale as it presently stands should be limited.

The group differences we uncovered resulted in interesting findings. First, health history was found to be important for the subject only. Having a close relative with a serious illness was not associated with less optimism. However, subjects who had themselves had a life-threatening illness were much less likely to be unrealistically optimistic about their health.

Second, locus of control was found to be extremely important for unrealistic optimism about future health and illness. People with an internal locus of control were the most optimistic, followed by people who believed "powerful others" were in control. The least optimistic were people who believed that chance played the most important role in determining health outcomes. The finding that people who believe they are in control are more optimistic about their future health is consistent with Weinstein's (1987) finding that perceived controllability is associated with higher optimism.

Third, although present-oriented people were expected to be more optimistic than future-oriented people, no mean differences were revealed. This non-significant finding, however, may be the result of the time orientation scale used. In the future, it is recommended that these differences be investigated by another time perspective scale.

The correlational analyses indicated that there is a relationship between locus of control and cognitions pertaining to an unrealistic optimism about health. Subjects who had a high internal locus of control were more likely to be optimistic, whereas subjects who believed chance was more in control were less optimistic. These findings were consistent across all three factors of the UHC scale; the more optimistic the person, the less weight they put in chance. Although these are in line with Weinstein's (1982, 1984) earlier findings, these results clarify the controllability-optimism relationship. Personal controllability does appear to be related to unrealistic optimism, but control by powerful others (i.e., doctors) is not.

In summary, our findings suggest that there are cognitions beyond mere illness controllability which may underlie an unrealistic optimism about health. Cognitions that affect unrealistic beliefs about future health may lead to irresponsible health behavior. If individuals believe that they are unlikely to become ill, are not susceptible to disease, and are not concerned about becoming ill, they may be less inclined to take any precautions which may prevent them from becoming ill in the future, or more likely to engage in risky behavior.

Our results suggest that it is important for health promotional campaigns not only to give information concerning illness avoidance, but also to address the underlying cognitive biases. By having people focus upon how their actions may influence their susceptibility to future disease and illness -- by making them realize what their chances of getting ill really are given their present behaviors, familial health history, etc; by making them more concerned about possibly getting this disease; and by making them aware of their own susceptibility -- this may help to ensure that decision making processes are made from a realistic health perspective. A better understanding of an individual's health belief systems

can enable health educators to counter any erroneous beliefs when designing prevention programs. Since unrealistic optimism about future health remains a little-studied area, it is important that researchers continue to investigate its effects on disease prevention behaviors as well as examining the cognitions associated with such a perspective.

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